FxPro Quant

Strategy Builder

Making the creation of Expert Advisors as easy as it gets!

User Manual

v.3

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FxPro Quant – Making the creation of Expert Advisors as easy as it gets!

1. What Expert Advisors (EAs) are

An Expert Advisor (EA) is a mechanical trading system (MTS) which users can apply in order to automate their trading.

Expert Advisors can both inform the trader about a possibility to trade or even execute trades automatically by sending orders directly to the broker's trade server. Expert Advisors function on the basis of pre-programmed trading strategies that incorporate market price analysis, money management and trade execution rules set by the creator of the trading system. In simple words, a trader can record his trading strategy and then use programing language to write a small or large trading program that will follow the conditions set to initiate and close trades.

It is important to note that Expert Advisors run locally on your personal computer. Therefore, your trading platform must be running and connected to our servers in order for the system to function.

2. Why Use an Expert Advisor (EA)

2.1. Organise Your Thoughts

The mere attempt to record and codify your strategy is often enough to improve you as a trader. An Expert Advisor can also act as a valuable consultant even if you decide to monitor your trades manually.

2.2. Emotion-free Trading

Emotions can significantly affect trading decisions, especially when real money is on the line. Expert Advisors act on the basis of a fixed logic, allowing for the execution of emotion-free trades.

2.3. Make Trading Less Stressful

Trading without a pre-defined strategy may produce a lot of stress, especially when things do not go the way you hoped for. Deciding on position opening, lot size, Stop-Loss levels and actually sticking to the plan is sometimes much harder than it sounds. Using pre-programmed trading strategies, Expert Advisors can eliminate a trader's anxiety since the process of making trading decisions becomes calculative and unemotional.

2.4. Make Trading Less Time-consuming and Identify More Trading Opportunities

How many times have you switched on your computer and found that you are too late for grasping a trading opportunity? And, how many times were you forced to wait for hours in order to open/monitor a trading position? With the forex market open 24/5, such incidents may occur. However, using an Expert Advisor can significantly minimise the time you spend in front of a monitor. Use your time more wisely to form a trading strategy and let technology open, monitor and close your positions.

2.5. Avoid Trading Mistakes

Being human makes manual trading prone to mistakes. Making trading decisions as well as opening and monitoring trading positions may be affected by wrong calculations that compromise profit potential. For example, setting wrong Stop-Loss levels or miscalculating the size of an order can prove catastrophic for your investment.

Trusting these otherwise manual calculations to Expert Advisors can greatly increase the accuracy of your trading and help you achieve better results.

2.6. Back-testing, Demo-trading, Strategy Optimisation and Results Analysis

Creating an Expert Advisor that will help maximise your profits is in many ways like putting on a performance on stage. It is a process that requires rehearsing and modification so that you achieve as good results as possible.

Both FxPro MT4 and cTrader platforms support testing strategies on historic data to let you visualise the results on chart in order to improve and perfect your system for optimum performance. You can also compare between different versions and strategies and then test your system under current circumstances in a risk-free, demo environment.

You should take as much time as you need to make sure that the Expert Advisor you created will work in your favour and bring you the desired results.

3. Creating Strategies with the FxPro Quant Strategy Builder Tool

The FxPro Quant Strategy Builder is a revolutionary new tool, designed to act as your personal EA Developer. With simple drag-and-drop technologies and numerous inputs including technical indicators, mathematical functions, account info and market data, the Strategy Builder enables users to create their own Expert Advisors without requiring any MQL4 programming knowledge.

By introducing this service, FxPro virtually eliminates the barriers to entry that exist in the world of Automated Trading Robots, thereby allowing our clients access to cutting-edge technology that can significantly improve their trading performance.

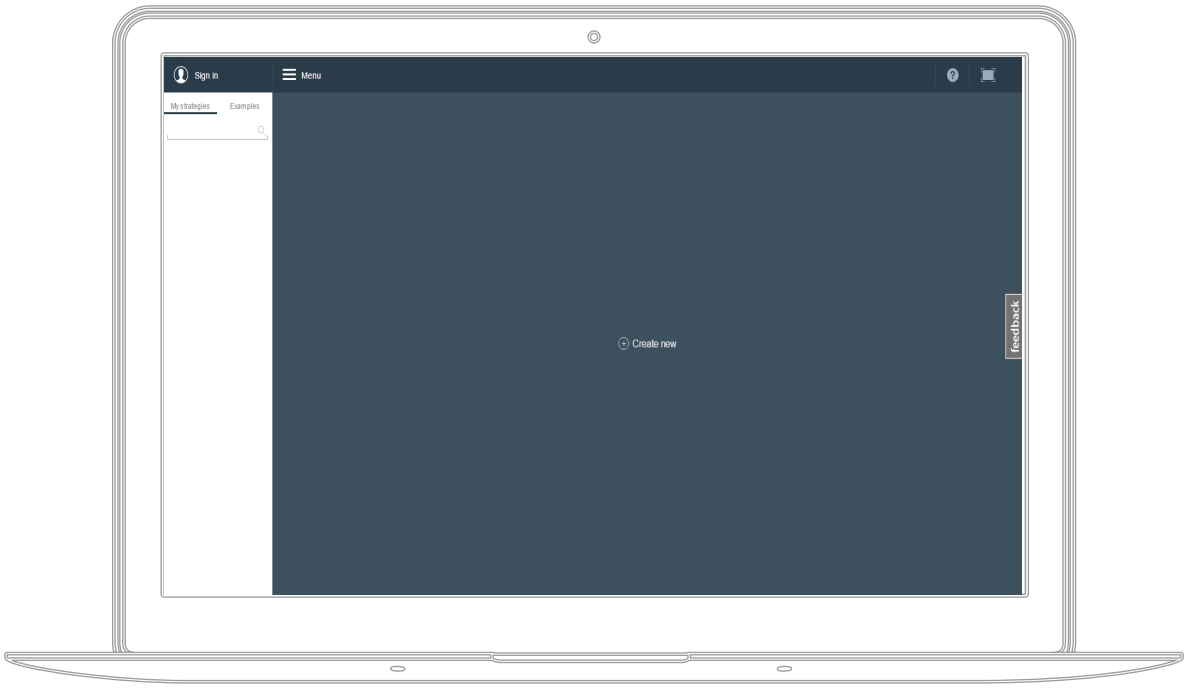
Whether you want an Expert Advisor to trade on your behalf or want to consult an Expert Advisor for your trades, the Strategy Builder tool can take your trading to the next level.

4. Getting Started

To access the FxPro Quant Strategy Builder, visit the FxPro Quant website (quant.fxpro.com) and click ‘Launch FxPro Quant’.

Once you launch FxPro Quant, you can sign in with your FxPro Direct credentials. However, you do not have to sign in to use the application.

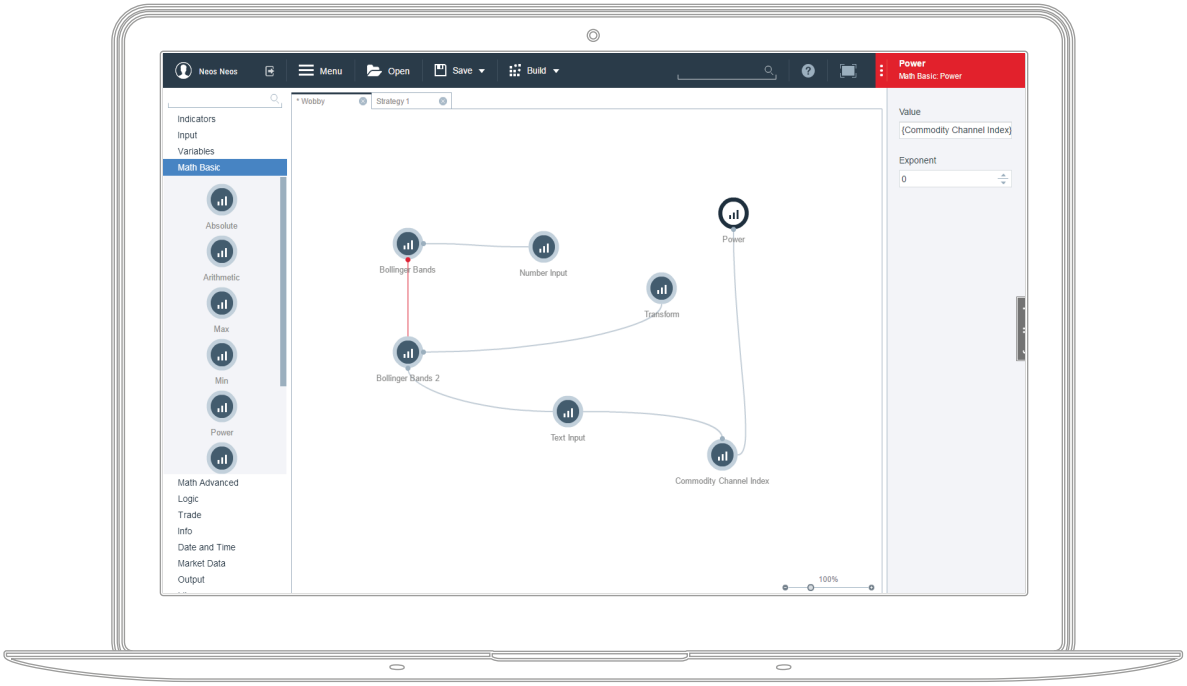
To start building your first robot, click ‘Create new’ or go to <Menu → Create New>.
You can name your robot and provide a description of it before you save it.
Both registered and unregistered users have access to a number of EA templates to use and/or modify. Click ‘Examples’ to see the list of available EA templates.



Registered users may store their strategies on server by clicking on ‘Save’ or ‘Save As’. Unregistered users may import/export the Quant File to their hard drive to continue working on their strategies (<Menu → Import/Export to File>).

Expert Advisors created/modified and saved by registered users will be presented in a list format and will be available for future use and/or modification in ‘My strategies.’

5. Interface & Menu



The FxPro Quant Strategy Builder screen consists of three main parts: the ‘Components Menu’, the ‘Main Workspace Area’ and the ‘Parameters Box’.

Components Menu: In the Components Menu you will find a list of all components available for use to build Expert Advisors.

Before you start building your Expert Advisor, click on ‘Platform Selector’ to choose a trading platform. You can choose between ‘MT4’, ‘cTrader’, and ‘MT4 and cTrader’. The Components Menu will update automatically and include the components available according to your selected platform.

The components are grouped into broad categories based on their functionality and use. An extended description of each function, or, ‘node’, is presented in the following pages of this manual.

Main Workspace Area: The Workspace serves as the drawing board for creating Expert Advisors. This is done by dragging and dropping functions onto the Workspace and then connecting them to each other using the available logic, in order to implement the user’s desired trading strategy.

The **Parameters Box** displays the selected node’s available parameters, if any, and allows for their customisation. These parameters are the same as on the selected trading platform.

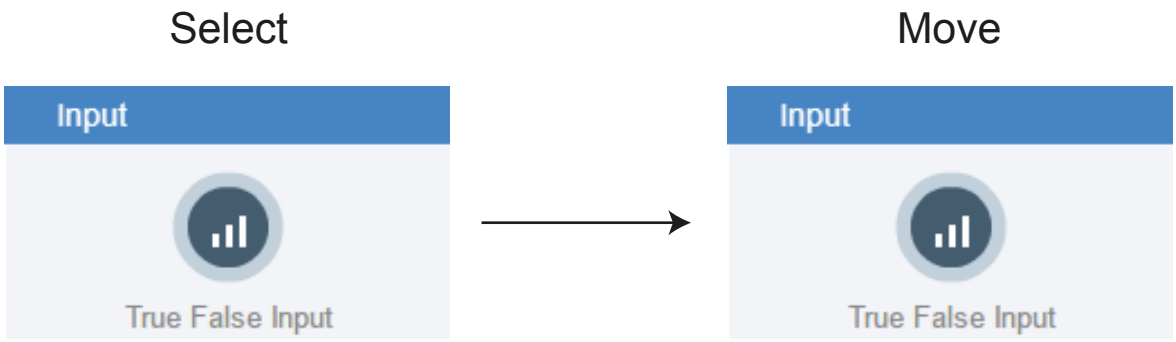
6. Main Components & Functionality

6.1 Drag & Drop

The FxPro Quant Strategy Builder is designed to be simple and user-friendly. To use its components, all you have to do is drag and drop any component anywhere on the Workspace Area.

Releasing the mouse also populates the Parameters Box with the node's specific parameters.

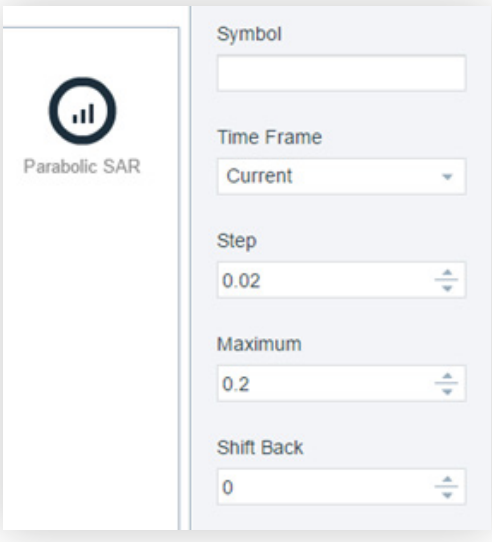
Simply select any node on the Workspace Area to move it around, modify its parameters or remove it altogether.



6.2 Main Component Groups

The Components Menu groups all functions into broad categories of nodes which serve as building blocks for the creation of Expert Advisors.

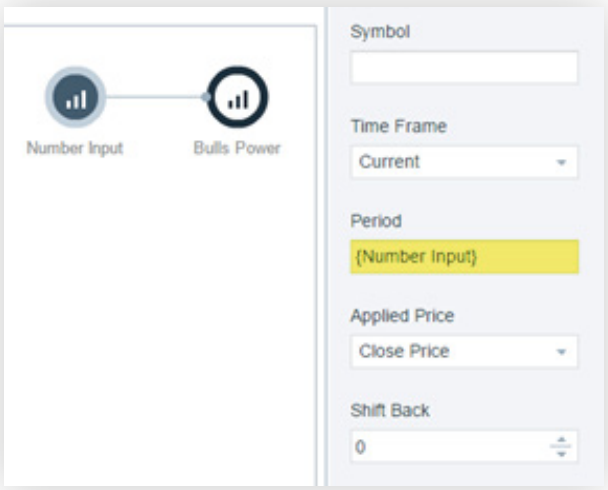
• Indicators - Includes standard indicators supported by the selected trading platform and allows customisation of the same inputs as the platform selected.



Example of a 'Number Input' used to set the value of the parameter 'Period' in the 'Bulls Power' indicator.

Input

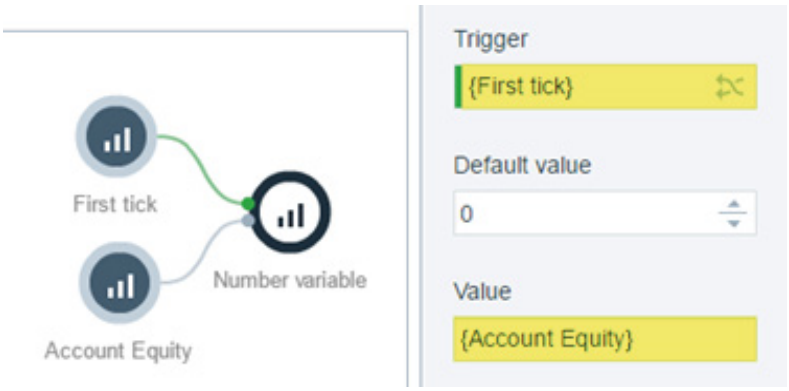
Includes external inputs that can be assigned to other nodes. There are four types of inputs available, namely, Boolean, Number, Integer, and String.



Example of a 'Number Input' used to set the value of the parameter 'Period' in the 'Bulls Power' indicator.

Variables

Nodes used to store value between the ticks. There is a corresponding Variable Node for each data type, including Boolean, Number, Text, and Date Time.



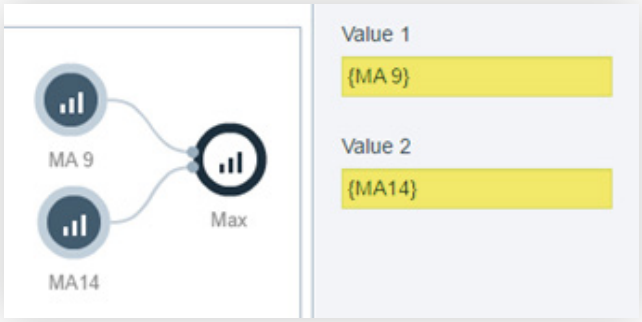
Example of a 'Number Input' used to set the value of the parameter 'Period' in the 'Bulls Power' indicator.

Math Basic

These are mathematical operations used to derive values for use in our Expert Advisor models.

Example of a ‘Math’ node: Using the ‘Max’ function connected to two moving averages - set as Value1 and Value2 - will always return the maximum value of the two.

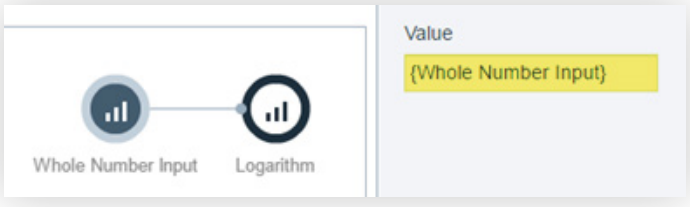
If for example MA9=4 and MA14=7 our Max(4,7)=7.



Math Advanced

These are more advanced mathematical operations, including functions such as ‘Exponential’, ‘Modulus’ and ‘Square Root’.

Example of a ‘Math Advanced’ node: Using the ‘Logarithm’ function connected to a ‘Whole Number Input’ node so as to derive the logarithmic value of the number.

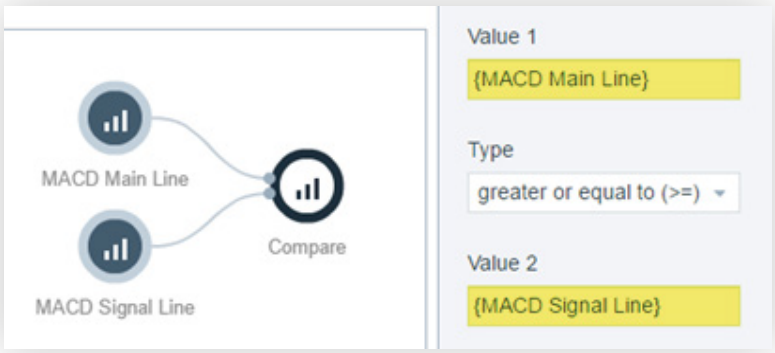


Logic

Nodes used in order to connect a system's parts together. There are three logical operations: 'Compare', 'AND', 'OR'.

Example of a 'Logic' node: Comparing the value of the 'MACD Main Line' (Value 1) with the value of the MACD Signal Line' (Value 2).

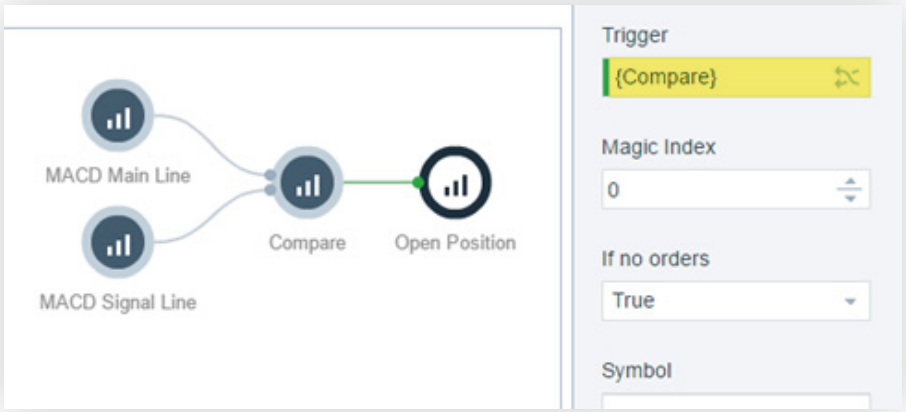
The logical statement examined here is whether Value1>=Value2.



Trade

Trading operations used to initiate, modify or close trades.

Example: A 'Trade' node: Initiating a new trading position based on the comparison of the current value of the 'MACD Main Line' with the value of the MACD Signal Line'.



Info

Nodes which return account and market info.

Example of an ‘Info’ node: Using the ‘Free Margin’ level available in an account as one of the conditions for initiating a new trading position.

Date and Time

Nodes which are used to work with dates.

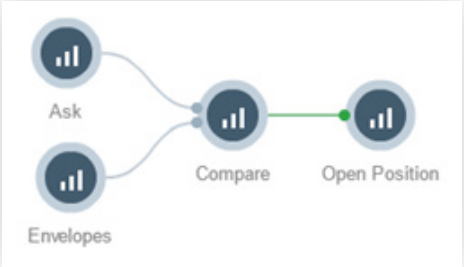
Example showing how to close an order a while after its opening.

Market Data

Instrument-related data drawn from the market.

Example of a ‘Market Data’ node: Initiating a new trading position based on the comparison of the current ‘Ask’ price with the value of the ‘Envelopes’ band.

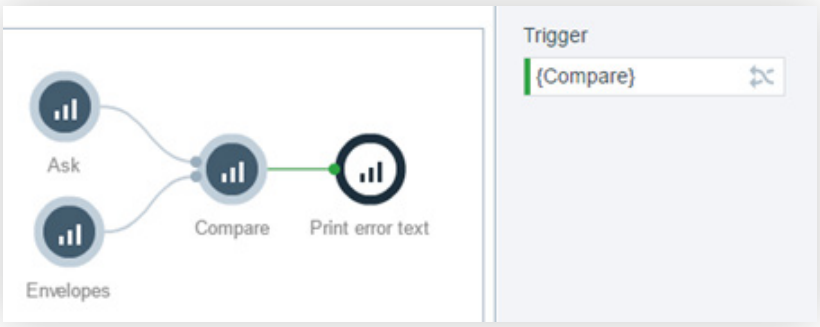
Note that the ‘Ask’ node has no parameters to customise since it merely returns the price of the best Ask price from the market.



Output

Reporting functions such as alerts and error texts to aid with the testing of Expert Advisors.

Example of an ‘Output’ node: Detecting error messages on the ‘Compare’ node of the previous example.

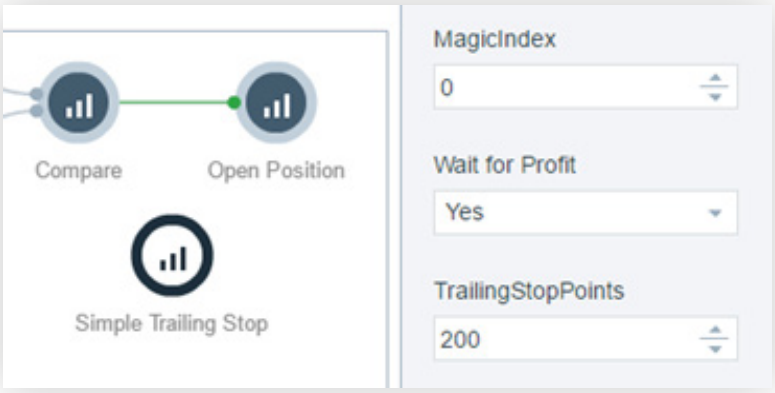


Library

Custom-built FxPro functions intended to facilitate the creation of more complex Expert Advisor systems.

Example of a ‘Library’ node: Dragging and dropping a ‘Simple Trailing Stop’ node can introduce automatic trailing stops for open orders.

Please note that ‘Trailing Stop’ nodes are stand-alone nodes. That is, they do not need to be connected to any other system nodes in order to be activated.



6.3 Connectors

Having explained the process of selecting a node from the Components Menu and placing it onto the Workspace, we will now look at how you can connect and combine the nodes in order to build the logic of your Expert Advisor.

In the FxPro Quant Strategy Builder, you can combine nodes and form more complex logical statements through the use of 'Connectors'.

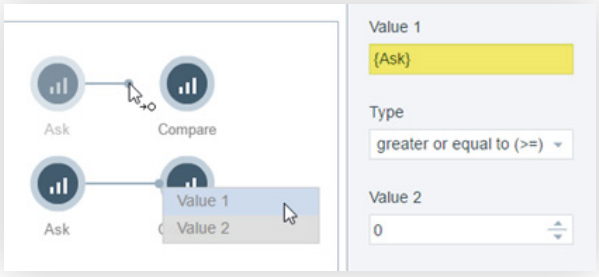
Connectors are built in every node. To reveal a connector, simply click anywhere on a node's outer diameter and drag the mouse.

There are four different types of connections that can be established between nodes. In order to demonstrate how these types of connections work, we will present a simple Expert Advisor construction as an example:

6.3.1 Types of connections

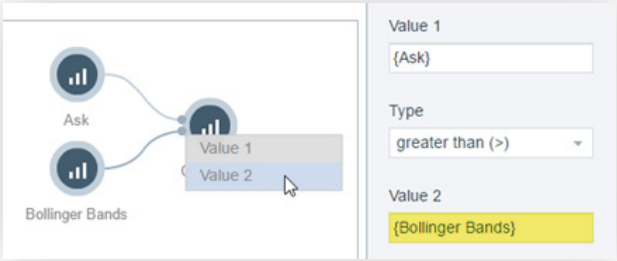
6.3.1.1 Comparing functions

To make a comparison between two nodes or between one node and a 'Number Input', drag the connector onto the compare node's outer diameter.



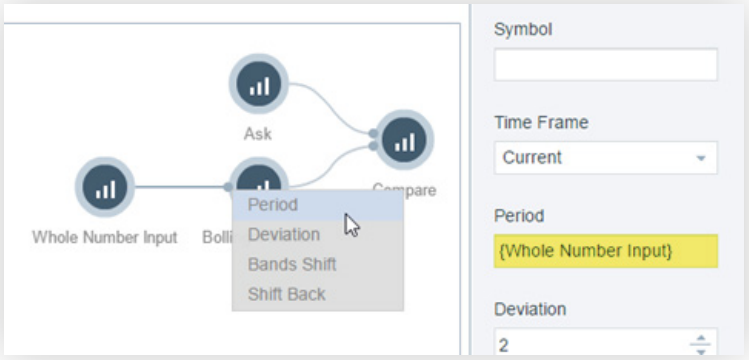
When the mouse is released, you will be prompted to select whether the newly connected node will represent Value 1 or Value 2 in the compare relationship. You may then select to compare the value of the node (the 'Ask' price of the instrument in this case) with either another node's value or a number that can be typed in the 'Compare' node's Parameters Box as Value 2.

Expanding on this example, let's consider that we are interested in creating an Expert Advisor that sells when the underlying instrument's 'Ask' price is higher than the upper band of the 'Bollinger Bands' (BB). Setting the 'Bollinger Bands' node as Value 2 will automatically populate the relevant field on the 'Compare' node's Parameters Box.



6.3.1.2 Defining function values

Now consider that we wish to set an external ‘Number Input’ so as to be able to change the ‘Bollinger Bands’ period when our Expert Advisor is completed. By dragging in the relevant node and connecting it to the ‘Bollinger Bands’ node, a new window appears enquiring which parameter of the ‘Bollinger Bands’ system we would like the ’Number Input’ to stand for.



As presented in the figure above, selecting the ‘Period’ parameter will populate the relevant field in the ‘Bollinger Bands’ node and the length of the relevant period will thereafter be controlled by the external ‘Number Input’. Please also note that, for the sake of this example we select ‘Upper Line’ as the ‘Bollinger Bands’ ‘Output Value’ so as to compare our ‘Ask’ price with the upper line of the Bollinger Bands.

6.3.1.3 Resulting output

Having completed our input comparison structure, we now wish to command the Expert Advisor to sell whenever these conditions are met. To do so we introduce an ‘Open Position’ node from the ‘Trade’ category which we rename to ‘Sell Order’ for convenience.

You will notice that the connector that appears between the ‘Compare’ node and the ‘Sell Order’ is green coloured.

Connectors that originate from ‘Logic’ and ‘Trade’ categories appear in green colour, indicating the positive association with the condition set. In the Expert Advisor created here, the ‘Sell Order’ will be executed only if the condition we have set is met.

6.3.1.4 Reverse output

The FxPro Quant Strategy Builder also allows us to use nodes as triggers in the event that the condition set is not met.

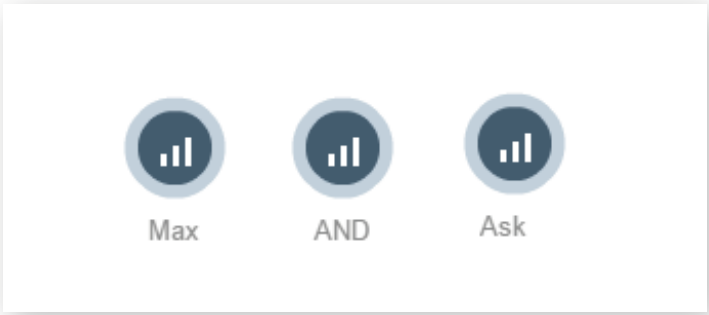
To demonstrate this functionality, let's assume that the Expert Advisor of our example is required to execute a 'Close Sell' in the event that our condition is not met. This means that when the 'Ask' price of the underlying instrument is not higher than the upper band of the 'Bollinger Bands', the Expert Advisor should close the open 'Sell Order'. Dragging on the Workspace a 'Close Position' node, we rename it to 'Close Sell' and customise its parameters.

The condition we need to set is the exact opposite of what we have set for our 'Sell Order'. That is, we need to reverse the parameter value by clicking the 'Reverse' button.

6.3.2 If two nodes do not connect, it means they are not meant to

Connecting functions to create your system is admittedly as easy as it gets with the FxPro Quant Strategy Builder. In some cases, however, you will find that some nodes refuse to connect with each other. This will mean that there is no logic in the sentence you are attempting to create.

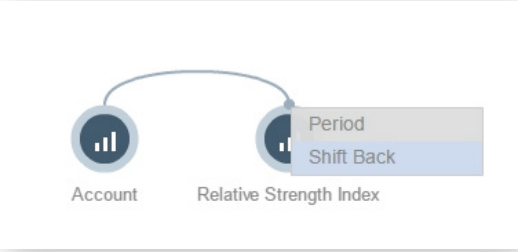
Consider for example the following three nodes:



Connecting the ‘Max’ node or the ‘Ask’ node to an ‘AND’ node cannot possibly make any logical sense since there is no condition to be satisfied in order for our statement to be true. Attempting to connect the ‘Ask’ node to the ‘Max’, however, makes perfect sense, since it will represent one of the values to be compared in order to derive the maximum – Max (Ask, Value 2).

6.3.3 Nodes that do connect are not necessarily right for each other

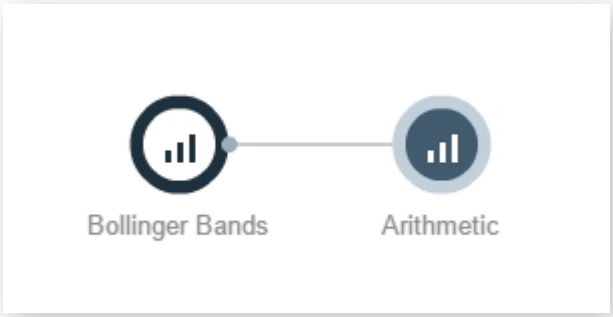
Connecting the ‘Account Balance’ node to the Relative Strength Index is permissible, since the oscillator may receive input values for both its ‘Period’ and ‘Shift Back’ to be used in the calculations. However, to connect these two nodes with each other does not make much sense.



6.3.4 The importance of direction in connecting two nodes

Can you spot the difference between the two combinations presented below?

Case A

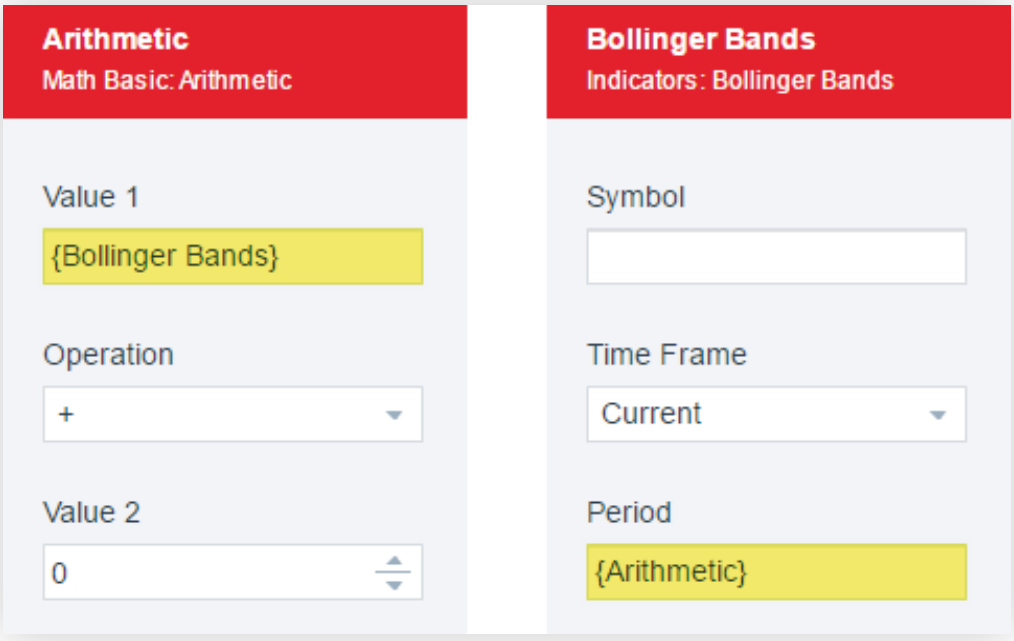


Case B

At first glance they may look alike, but in Case A the 'Bollinger Bands' node connects to the 'Arithmetic' node, while Case B presents the exact opposite.

There is a huge difference between these two cases.

This becomes obvious when we review the Parameters Box of each case. In Case A, the calculated value of the 'Bollinger Bands' has been used as an external input to substitute for 'Value 1' used in the calculation of the 'Arithmetic' operation (BB Value +2 in this case). In Case B, however, it is the sum derived by the 'Arithmetic' operation that is used as a parameter to derive the 'Bollinger Bands', substituting for the 'Period' in the calculations.



Case A

Case B

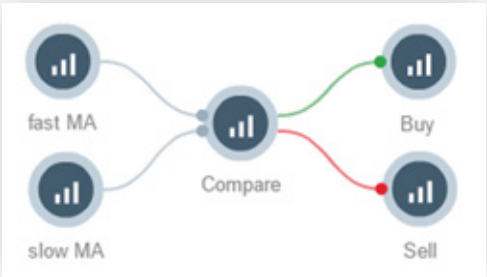
6.4 The Magic Index

You may have noticed that there is a ‘Magic Index’ parameter for all nodes that involve trading operations. A ‘Magic Index’ node can also be found under the Trade category.

The Magic Index number helps the Expert Advisor identify open positions. It is necessary for changing Stop Loss or Take Profit parameters, as well as for retrieving position data and closing particular positions.

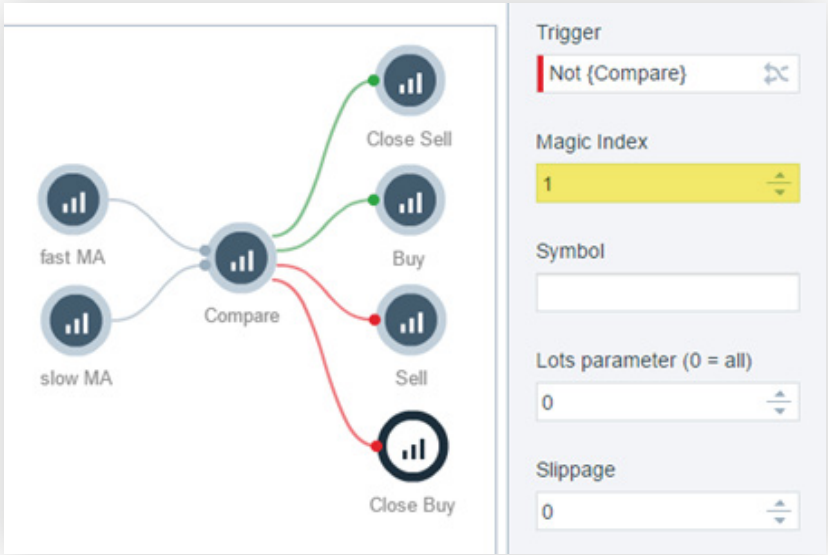
Let’s look at an example:

Consider that an Expert Advisor is built in order to initiate ‘Buy’ and ‘Sell’ orders based on a simple Moving Average (MA) crossover system. This means that the system will be opening both types of trades whenever these conditions are met. It will perform a ‘Buy’ order whenever the fast MA crosses above the slow MA, and a ‘Sell’ order in opposite conditions.



Now, consider that we also want to instruct our Expert Advisor to close these trades when the reverse happens. That is, to close the ‘Buy’ trade when the fast MA crosses below the slow MA, and vice versa.

The ‘Magic Index’ is what helps our Expert Advisor determine which trades to close in the case that we instruct it to close only the ‘Buy’ orders.



By using the same ‘Magic Index’ for ‘Buy’ and ‘Close Buy’ and a separate ‘Magic Index’ for ‘Sell’ and ‘Close Sell’, the system recognises which orders to close.

A ‘Magic Index’ node can also be found under the ‘Trade’ category. This node allows the index number to be set as an external input linked directly to other nodes. This means that the index number will be used in a similar manner with the ‘Number Input’, as this is portrayed in the example under section 6.3.1.2 (‘Defining function values’) of this manual.

7. Save, Import and Export

Once you create a new strategy or modify an existing one on the FxPro Quant Strategy Builder, you need to save it for future use.

Registered users can save their strategies by clicking the ‘Save’ button. The Expert Advisors will be saved on the server, and will appear under the ‘My Strategies’ list.

Both registered and unregistered users can use the ‘Export to file’ and ‘Import from file’ Menu options. The two options allow you to save or load your strategy to/from your hard disk. This file can be shared with other users.

Note: By saving a strategy you save the nodes and links data. Your strategy data is therefore saved in FxPro Quant file format. To see how you can get the code of an Expert Advisor for a trading platform, please refer to section 8 (‘Build for MT4 and cTrader) of this manual.

8. Build for MT4 and cTrader

In order to use the strategy you have created in the FxPro Quant Strategy Builder, you must export the code. The way in which you export and apply your strategy to your trading depends on the platform you are using, since the programming language for implementing trading strategies to MT4 is MQL4, while for cAlgo it is C#.

Click on ‘Build’ to get the code for the trading platform you are using. You may then choose whether you want to copy the code to clipboard, or whether you want to save it to file.

Once you have the strategy code, you need to compile it.

Compile your Expert Advisor for MT4

1. Open MT4 and go to ‘Tools’ → ‘MetaQuotes Language Editor’
2. Click on ‘New’ → Create new Expert Advisor
3. Replace default text with your strategy code from FxPro Quant
4. Click ‘Compile’. Your Expert Advisor will then be available in MT4

Compile your cBot for cAlgo

1. Open cAlgo and click on ‘New’ to create a new cBot
2. Replace default text with your strategy code from FxPro Quant
3. Click ‘Build’

9. Strategy Builder Functions (Nodes)

9.1. Indicators

Accelerator Decelerator (MT4 & cTrader)

The Accelerator Decelerator (AC) is used to measure acceleration/deceleration of the current driving force. As such, it is used to predict the change of the driving force in the market. The Accelerator Decelerator changes direction before any changes occur in prices, thereby providing an early warning. (Bill J. Williams)

Accumulation Distribution (MT4)

The Accumulation Distribution tracks the relationship between price and volume and acts as a leading indicator of price movements. The indicator uses volume to confirm price trends or warn of weak movements that could result in a price reversal. (Marc Chaikin)

Average Directional Movement (MT4)

The Average Directional Movement (ADX) system is designed to primarily determine whether a traded instrument is trending and, if so, the direction in which it is moving. (J. Welles Wilder)

Alligator (MT4)

The Alligator is a trend identification tool that makes use of three Moving Averages to represent the movements and interaction between different time periods. Designed to detect the beginning and exhaustion of trends, this indicator will typically perform poorly in ranging markets. (Bill J. Williams)

Average True Range (MT4 & cTrader)

The Average True Range (ATR) is a measure of volatility. It is a Moving Average of the true ranges. (J. Welles Wilder)

Awesome (MT4 & cTrader)

The Awesome (AO) is designed to show the current market momentum. It is created using the difference between the 34-period and 5-period Simple Moving Averages of the bar's midpoints (H + L) / 2. (Bill J. Williams)

Bears Power (MT4 & cTrader)

The Bears Power indicator shows the strength of the sellers in the market. If the indicator is below zero, the sellers, or bears, are strong; if it is above zero, they are weak. The indicator aims at identifying if a bearish trend will continue or if the price has reached a point where it might reverse. (Alexander Elder)

Bollinger Bands (MT4 & cTrader)

The Bollinger Trading Bands® (BB) wrap around the price chart and measure volatility. They widen during volatile markets and contract during calmer periods.

Bulls Power (MT4)

The Bulls Power indicator shows the strength of the buyers in the market. If the indicator is above zero, the buyers, or bulls, are strong; if it is below zero, they are weak. This indicator aims at identifying if a bullish trend will continue or if the price has reached a point where it might reverse. (Alexander Elder)

Bill Williams Market Facilitation (MT4)

The Bill Williams Market Facilitation (MFI) attempts to determine the efficiency of price movement by quantifying the price movement per unit of volume. (Bill J. Williams)

Commodity Channel Index (MT4 & cTrader)

The Commodity Channel Index (CCI) measures the variation of the underlying instrument's price from its statistical mean. (Donald Lamber)

DeMarker (MT4)

Based on the comparison of the period maximum with the previous period maximum, the DeMarker (DeM) indicator attempts to measure the demand for the underlying instrument. The index is used to determine overbought/oversold conditions. (Tom DeMark)

Envelopes (MT4)

The Envelopes trading bands define the upper and lower boundaries of an instrument's normal trading range. They comprise two Moving Averages shifted upward and downward.

Force Index (MT4)

The Force Index (FI) is an indicator that uses price and volume to assess the power behind a move or identify possible turning points. The Force Index combines direction, extent and volume as an oscillator that fluctuates in positive and negative territory as the balance of power shifts. (Alexander Elder)

Fractals (MT4)

The Fractal indicator uses a series of at least five successive bars to identify resistance/support levels and is used in order to determine turning points. (Bill J. Williams)

Gator (MT4)

The Gator oscillator tracks the periods when the Alligator indicator balance lines widen or narrow down (convergence/divergence). As a trend indicator, it is most useful during strong directional trends. (Bill J. Williams)

Ichimoku (MT4 & cTrader)

The Ichimoku Kinko Hyo is a Moving Average-based trend identification system that builds on candlestick charting with the aim to improve the accuracy of forecast price moves. It factors in time as an additional element along with the price action. (Goichi Hosoda).

MACD (MT4 & cTrader)

The MACD is a trend-following indicator based on the relationship between two Exponentially Smoothed Moving Averages of the closing prices. (Gerald Appel)

Momentum (MT4 & cTrader)

The Momentum indicator measures the change that an instrument's price has registered over a given period of time. (J. Welles Wilder)

Money Flow Index (MT4 & cTrader)

The Money Flow Index (MFI) measures the strength of money flowing in and out of an instrument over a given time span. It is related to the Relative Strength Index (RSI) but also accounts for volume. (Gene Quong, Avrum Soudack)

Moving Average (MT4 & cTrader)

A Moving Average is an indicator that takes the average value of a security over a given period of time.

On Balance Volume (MT4 & cTrader)

The On Balance Volume (OBV) is a momentum indicator that relates volume to price change. It is a running total on volume showing the money flowing in and out of an instrument. (Joe Granville)

Moving Average of Oscillator (MT4)

The Moving Average of Oscillator (OsMA) determines the difference between the MACD oscillator and the Signal Line of the oscillator. In certain systems, the oscillator is sometimes called MACD Histogram.

Parabolic SAR (MT4 & cTrader)

The Parabolic Stop and Reverse (SAR) is a trend-following system constantly tailing the price action. It is often used by traders to set trailing price stops. The aim is to pinpoint when there is a higher-than-normal probability of a trend reversal. (J. Welles Wilder)

Relative Strength Index (MT4 & cTrader)

The Relative Strength Index (RSI) is a smoothened price-following oscillator with a range of 0-100. It is a very popular countertrend oscillator. This setup works best in a range environment when overbought/oversold readings are more likely to signal a change in direction. (J. Welles Wilder)

Relative Vigor Index (MT4)

The Relative Vigor Index (RVI) compares the positioning of a security's closing price relative to its price range, and the result is smoothed using an Exponential Moving Average of the values. The idea behind the Relative Vigor Index is that the energy of the move is established by where the prices end up at the close.

Standard Deviation

The Standard Deviation is a statistical measure of volatility typically used as a component for other indicators.

Standard Deviation (MT4 & cTrader)

The Standard Deviation is a statistical measure of volatility typically used as a component for other indicators.

Stochastic (MT4 & cTrader)

The Stochastic (K%D) compares where the underlying instrument's closing price is relative to its price range over a given period of time, based on the observation that prices tend to close near the extreme of the trading range during uptrends/downtrends. (George Lane)

Williams' Present Range (MT4 & cTrader)

The Williams Percent Range (%R) is a momentum indicator measuring overbought/oversold levels. It is similar to the Stochastic Oscillator, except that it is plotted upside-down. (Larry Williams)

Custom Indicator (MT4)

Allows access to the value of a Custom Indicator that is installed on the platform.

9.2. Input

True False Input (MT4 & cTrader)

Specifies a Boolean external input for the whole EA. For example, True/False.

Whole Number Input (MT4 & cTrader)

Specifies a whole number external input for the whole EA. For example, 123, -321.

Number Input (MT4 & cTrader)

Specifies a decimal number external input for the whole EA. For example, 1, 1.12345, -5.12323, -0.0001.

Text Input (MT4 & cTrader)

Specifies a text external input for the whole EA. For example, MyEAName, EURUSD.

Date Time Input (MT4)

Specifies a date and time external input for the External Advisor. For example, 01/01/2015 15:30:00.

9.3. Variables

True False Variable (MT4 & cTrader)

Specifies a Boolean variable that can be used to remember values. For example, True/False.

Number Variable (MT4 & cTrader)

Specifies a decimal number variable that can be used to remember values. For example, 1, 1.12345, -5.12323, -0.0001.

Text Variable (MT4 & cTrader)

Specifies a text variable that can be used to remember values. For example, MyEAName, EURUSD.

Date Time Variable (MT4 & cTrader)

Specifies a date and time variable that can be used to remember values. For example, 01/01/2015 15:30:00.

9.4 Math Basic

Absolute (MT4 & cTrader)

Returns the absolute value of the specified numerical input. For example, -2 will return 2 and 2 will return 2.

Arithmetic (MT4 & cTrader)

Returns the result of a basic arithmetic operation – addition (+), subtraction (-), multiplication (*) and division (/).

Max (MT4 & cTrader)

Returns the smallest of the two specified numerical inputs. For example, Min(4, 5.6) = 4.

Min (MT4 & cTrader)

Applies the natural logarithm function to the specified numerical input. For example, log(123).

Power (MT4 & cTrader)

Raises the specified numerical input to the specified power.
For example, 4 to the power of 2 will return 16.

Round (MT4 & cTrader)

Rounds a decimal number to the specified level of precision or alternatively introduces a ceiling or a floor.

Transform (MT4 & cTrader)

Transforms decimal values like 0.00010 into whole numbers like 10 and vice versa. The conversion digits are automatically selected based on the instrument in question.

Conditional Arithmetic (MT4 & cTrader)

If conditions are met, it performs the specified arithmetic operation and returns the result. If conditions are not met, it returns unchanged Value 1.

9.5 Math Advanced

Exponential (MT4 & cTrader)

Returns the value of e raised to the power of specified numerical input.

Logarithm (MT4 & cTrader)

Applies the natural logarithm function to the specified numerical input. For example, log(123).

Modulus (MT4 & cTrader)

Returns the floating-point remainder of division of two numbers.

For example if x = -10 and y = 3, since x = a(y) + b => -10 = -3(3) – 1.

»»»»»»» b = MathMod(x,y) = -1

Random Number (MT4 & cTrader)

A random value is chosen from a range of values specified by the user. Choosing ‘Reset with time’ will enhance operation.

Square Root (MT4 & cTrader)

Returns the square root of specified numerical input. For example, Square Route (16) = 4.

Trigonometric (MT4 & cTrader)

Applies a trigonometric function to a given numerical input. For example, Sin, Cos, Tan, etc.

9.6 Logic

Compare (MT4 & cTrader)

Allows the comparison of two different values in terms of equal, larger or smaller (=, >=, <=, <, >). This node is triggered when the condition (i.e. the comparison of two values) set evaluates to true. For example, if Value 1 >= Value 2.

AND (MT4 & cTrader)

Allows you to add together a number of different conditions. The node is triggered when all of its inputs nodes are triggered. Please note that only other logic operations can be connected to an ‘AND’ function (Compare, AND, OR). It is possible to combine several ‘AND’ functions in a single statement, which is useful when creating complex expressions.

OR (MT4 & cTrader)

Allows you to check if either (or all) of the conditions connected are valid. The node is triggered if at least one of its input nodes is triggered. Please note that only other logic operations can be connected to an ‘OR’ function (Compare, AND, OR). It is possible to combine several ‘OR’ functions in a single statement, which is useful when creating complex expressions.

9.7 Trade

Magic Index (MT4 & cTrader)

The Magic Index number is one of the parameters of the OrderSend() function, used in MQL4 to open a new order. It is a unique number assigned to your orders as a reference that enables Expert Advisors to differentiate between the orders that opened and those orders opened manually or by another Expert Advisor. This node allows the Magic Index number to be set centrally and then linked directly to other nodes.

No Orders (MT4 & cTrader)

Returns 'True' if there are no open trades for any of the specified Magic Indices.

Order Status (MT4 & cTrader)

Checks whether an order with specific Magic Index has the specified property. For example, if it is a Buy/Sell order, a market/pending order, etc.

Order Data (MT4 & cTrader)

Extracts specified information from an order with the specific Magic Index number, including Order Ticket, Open Price, Profit, Stop Loss, etc.

Order Open Time (MT4 & cTrader)

Returns order open time. The order is recognised by its specified Magic Index number.

Open Position (MT4 & cTrader)

Opens a market order whenever the node is triggered. The market order can be either long or short, depending on the 'Side' preference set by the user.

Close Position (MT4 & cTrader)

Closes a market order with the specified Magic Index whenever the node is triggered.

Delete Pending (MT4 & cTrader)

Deletes a pending order with the specified Magic Index whenever the node is triggered.

Modify Position (MT4 & cTrader)

Modifies the Stop-Loss or Take-Profit levels of an open order. The order is recognised by its specified Magic Index.

Send Pending (MT4 & cTrader)

Opens a pending order whenever the node is triggered. The price is either an absolute price value (for example, 1.12345) or a number of points above/below current price (for example, 200).

Modify Pending (MT4 & cTrader)

Modifies the Stop-Loss or Take-Profit levels of a pending order. The order is recognised by its specified Magic Index.

Order Expiration (MT4 & cTrader)

Returns the expiration time of a pending order. The order is recognised by its specified Magic Index number.

9.8. Info

Account (MT4 & cTrader)

Contains all available account information, including Balance, Equity, Free Margin, Profit, etc.

Date and Time (MT4 & cTrader)

Contains date and time information, including Hour, Minute, Day of Week. The time is based on the server time (GMT+2).

Digits (MT4 & cTrader)

Returns the number of digits after the decimal point in the quote of the current price. For example, it returns 5 for EURUSD; 3 for USDJPY, etc.

Last Error (MT4)

Returns error ID of the last error that occurred during the Expert Advisor execution. For example, it returns 130 if failed to send order due to invalid stops.
(A list of possible errors can be found at: http://docs.mql4.com/constants/errors)

Leverage (MT4 & cTrader)

Returns the maximum leverage allowed for the account.

Period (MT4 & cTrader)

Returns the timeframe of the chart that the Expert Advisor is applied to.
Please note that if, for example, we are using a 3-hour chart, this function will return the number of minutes included in this timeframe in a numerical form (120).

Point (MT4 & cTrader)

Shows the minimum price change of the current Symbol. For example, it will return 0.00001 for EURUSD.
Please note that one point for each currency pair is equal to 1/10 of its Pip.

Status (MT4 & cTrader)

Contains information about the current state of the platform, including Connection to Broker, Demo or Live Account, Backtest or Live Trading, etc.

Symbol (MT4 & cTrader)

Returns the Symbol of the chart that the Expert Advisor is applied to. For example, EURUSD.

9.9. Date and Time

DateTime Now (MT4 & cTrader)

Returns current server time.

Modify DateTime (MT4 & cTrader)

Changes time value by adding a time span such as minutes or days. To subtract time span, you may set negative value.

Construct DateTime (MT4 & cTrader)

Constructs DateTime value from date and time components such as hour, day or month.

Compare DateTime (MT4 & cTrader)

Allows for the comparison of two date and time values in terms of equal, larger or smaller (=, >=, <=, >, <). This node is triggered when the condition (i.e. the comparison of two dates) set evaluates to true. For example, Date 1 >= Date 2.

9.10 Market Data

Ask (MT4 & cTrader)

Ask price of the latest tick. This is the lowest quoted offer price among the available sellers.

Bid (MT4 & cTrader)

Bid price of the latest tick. This is the highest quoted offer price among the available buyers.

First Tick (MT4 & cTrader)

This node is triggered on the first tick of every new Bar.

Historic Data (MT4 & cTrader)

Bar chart data, including High, Low, Open and Close prices registered, etc.

Instrument Info (MT4)

Instrument specific information, including Minimum Lot, Spread, etc.

9.11 Output

Alert (MT4)

Produces a visual alert with sound and specified image.

Chart Comment (MT4)

Writes text on the chart, starting from the top left corner.

Print Error Text (MT4)

Prints the last error that occurred during Expert Advisor execution to the ‘Experts’ tab.

Print Log (MT4 & cTrader)

Prints specific message to Expert Advisor logs tab.

Send Mail (MT4)

Sends email notification. The SMTP setting on the trading platform must be configured in order to enable this node to trigger.

Mobile Notification (MT4)

Sends a notification message to a smartphone. The notification setting on the trading platform must be configured in order to enable this node to trigger.

9.12 Library

Number of Open Trades (MT4 & cTrader)

Returns total number of currently open trades. This function checks only for trades with the specified Magic Index and current Symbol.

Total Open Lots (MT4 & cTrader)

Returns the sum of the lots of all currently open trades. This function checks only for trades with the specified Magic Index and current Symbol.

Net Open Lots (MT4 & cTrader)

Checks all currently open trades and returns the difference between the total sum of all the long trades and the sum of all the short trades. This function checks only for trades with the specified Magic Index and current Symbol.

Current Exposure Direction (MT4 & cTrader)

Returns '0' if there are no open trades; '1' if the net exposure is long; '-1' if the net exposure is short. This function checks only for trades with the specified Magic Index and current Symbol.

Close All Trades (MT4 & cTrader)

Closes all currently open trades. This function checks only for trades with the specified Magic Index and current Symbol.

Close All Long Trades (MT4 & cTrader)

Closes all currently long open trades. This function checks only for trades with the specified Magic Index and current Symbol.

Close All Short Trades (MT4 & cTrader)

Closes all currently short open trades. This function checks only for trades with the specified Magic Index and current Symbol.

Sell (MT4 & cTrader)

Opens a short trade with specified lots, Stop-Loss and Take-Profit levels, measured in points (1 pip = 10 points). This function will not open more trades that the specified 'MaxOpenTrades' set by the user. It will also not open trades more frequently than the specified 'MaxTradeFrequencyMins' number of minutes.

Buy (MT4 & cTrader)

Opens a long trade with specified lots, Stop-Loss and Take-Profit levels, measured in points (1 pip = 10 points). This function will not open more trades that the specified 'MaxOpenTrades' set by the user. It will also not open trades more frequently than the specified 'MaxTradeFrequencyMins' number of minutes.

Simple Trailing Stop (MT4 & cTrader)

Trails the Stop Losses of all currently open trades that have the specified Magic Index. Trailing Stop is calculated as the difference between the current price, plus/minus the user-specified 'TrailingStopPoints'.

Universal Trailing Stop (MT4 & cTrader)

Trails the Stop Losses of all currently open trades that have the specified Magic Index. Trailing Stop is determined by the Value parameter, which would be the value of any node that is connected to it. ExtraDeviationPoints are added to the indicator value for sell trades and deducted for the buy trades to ensure that the Stop Loss is trailed less aggressively if needed.

Break Even (MT4 & cTrader)

Sets the Stop Loss to entry as soon as the trade is in profit by the BreakEvenPoints.

Trade Exists (MT4 & cTrader)

Returns 'True' if there is at least one open trade with the specified Magic Index number, or 'False' if there are no open trades with the specified Magic Index number.

Capital at Risk (MT4 & cTrader)

Returns the total capital at risk in account currency. Risk per trade is calculated as Stop Loss points multiplied by the value of each point in account currency.

Only trades with the specified Magic Index and current Symbol are used for calculating risk.

Exposure for Magic (MT4 & cTrader)

Returns current exposure as a percentage of the account balance. Risk per trade is calculated as Stop Loss points multiplied by the value of each point in account currency. Only trades with the specified Magic Index and current Symbol are used for calculating risk.

Exposure for Account (MT4 & cTrader)

Returns current exposure as a percentage of the account balance. Risk per trade is calculated as Stop Loss points multiplied by the value of each point in account currency. All open trades are used for calculating risk.

Sell with MM (MT4 & cTrader)

Opens a short trade while ensuring that the exposure does not exceed any of the three MaxExposure parameters. If the calculated lot size is less than the minimum lot size, the trade will not open.

Buy with MM (MT4 & cTrader)

Opens a long trade while ensuring that the exposure does not exceed any of the three MaxExposure parameters. If the calculated lot size is less than the minimum lot size, the trade will not open.

Is Time (MT4 & cTrader)

Returns ‘True’ when the current server time is within the specified range, and can be used to restrict trade time or to make the Expert Advisor sleep. Start/End Hour may be set to the value between 0 and 23, and Minutes must be in the range of 0 to 59.

Recent Account Profit (MT4)

Returns the cumulative profit or loss of all trades closed within the specified number of hours and minutes, as well as the current profit or loss of all open trades.

Max Loss Daily (MT4)

Returns ‘True’ if the account has lost more than the specified maximum PercentageLoss of the balance at midnight.

Horizontal Line Price (MT4)

Returns the price of the horizontal line with the specified name. The node will produce ‘0’ if no line with such name is found.

Trend Line Price (MT4)

Returns the price of the trend line with the specified name at the specified bar shift. The node will produce ‘0’ if no line with such name is found.

Recently Hit Stop Loss (MT4)

Returns ‘True’ if there was a trade within the specified time limit and with the specified Magic Index that was closed with a Stop Loss, otherwise returning as ‘False.’

Last Error Text (MT4)

Returns last error in text format.

Disclaimer

The FxPro Quant Strategy Builder is a visual Expert Advisor ('EA') and cBot builder that has been developed outside FxPro (or 'the Firm') by a third party and is provided to you in good faith on an 'as is' basis. Therefore, the Firm accepts no responsibility for the use of the FxPro Quant and the build, installation and use of an EA and/or a template EA and/or a cBot developed through it. Under no circumstances shall FxPro be held responsible for any eventual inaccuracies, trading or other losses you may incur as a result of an EA and/or a template EA and/or a cBot developed through the FxPro Quant. Even if all reasonable efforts have been made by the Firm to ensure the proper operation of the FxPro Quant, FxPro cannot guarantee the accuracy of performance and/or results of any EA and/or a template EA and/or a cBot developed through the FxPro Quant. No representation is being made by the Firm in relation to certain results that may be achieved by an EA and/or a template EA and or a cBot developed through the FxPro Quant. Prior to running the FxPro Quant to develop an EA and/or a template EA and/or a cBot you need to carefully consider any risks including but not limited to those involved in trading Contracts for Difference. The Firm does not represent, warrant or covenant (i) the availability of the FxPro Quant/EA and/or a template EA and/or a cBot for an unlimited period of time, (ii) the continuous operation of the FxPro Quant/EA and/or a template EA, and/or a cBot and (iii) the performance or fitness of the FxPro Quant/EA and/or a template EA and/or a cBot for a particular purpose. By using the FxPro Quant to develop an EA and/or a template EA and/or a cBot you understand and accept that there is no such software that is free from any errors. You are advised to independently test and verify an EA and/or a template EA and/or a cBot developed through the FxPro Quant in a demo account environment prior to attaching the EA and/or a template EA and/or a cBot to a real trading account. You agree to hold FxPro, its officers, directors, employees, advisors, consultants and/or other partners harmless for any act or omission in the course of or in connection with the FxPro Quant and/or an EA and/or a template EA and/or a cBot developed through it.

Risk warning

Contracts for Difference (‘CFDs’) are complex financial products that are traded on margin. Trading CFDs carries a high level of risk since leverage can work both to your advantage and disadvantage. As a result, CFDs may not be suitable for all investors because you may lose all your invested capital. You should not risk more than you are prepared to lose. Before deciding to trade, you need to ensure that you understand the risks involved taking into account your investment objectives and level of experience. Past performance of CFDs is not a reliable indicator of future results. Most CFDs have no set maturity date. Hence, a CFD position matures on the date you choose to close an existing open position. Seek independent advice, if necessary. Please read FxPro’s full ‘Risk Disclosure Statement’ (http://www.fxpro.co.uk/documents/risk-disclosure-notice).

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